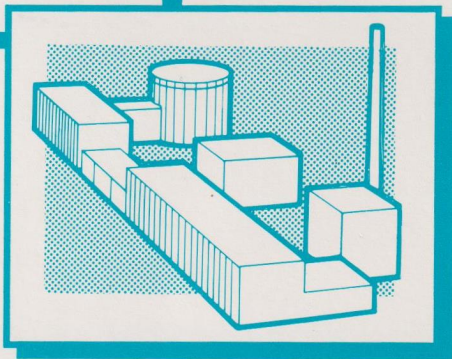
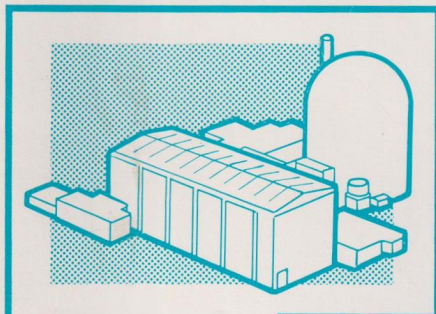


# EMERGENCY PLANNING AT CONNECTICUT'S NUCLEAR POWER PLANTS



A GUIDEBOOK FOR OUR  
NEIGHBORS

If you, or someone you know might need help in an emergency, please complete and return this card.

NAME		
ADDRESS		
CITY	STATE	ZIP CODE
PHONE NUMBER		
HOME		WORK
If you are a part-time resident (i.e., summer only), please list the months you are living at this address:		

**HELP NEEDED: (Check only those that apply)**

- ☐ I will need a ride. If yes, would you require a: ☐ Wheelchair van? ☐ Ambulance?
- ☐ Do you have special medical equipment that must be transported with you? ☐ Yes ☐ No  
If yes, what type? \_\_\_\_\_
- ☐ Would you need medical attention away from home such as special medication or oxygen? ☐ Yes ☐ No  
If yes, what type? \_\_\_\_\_

**SPECIAL CONDITION(S):**

- ☐ Confined to Bed ☐ Wheelchair Disabled ☐ Blind ☐ Deaf/Hearing-Impaired
- ☐ Vision-Impaired ☐ Other \_\_\_\_\_

**Even if you have previously sent in a card like this, you should send it in again when you receive a new booklet.**

**—THIS INFORMATION WILL REMAIN CONFIDENTIAL—**



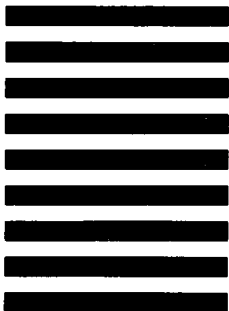
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HARTFORD ARMORY  
360 BROAD STREET  
HARTFORD CT 06105-9938



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**PLEASE KEEP THIS  
BOOKLET IN A HANDY  
PLACE IN YOUR HOME.**

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## **Emergency Planning at Connecticut's Nuclear Power Plants**

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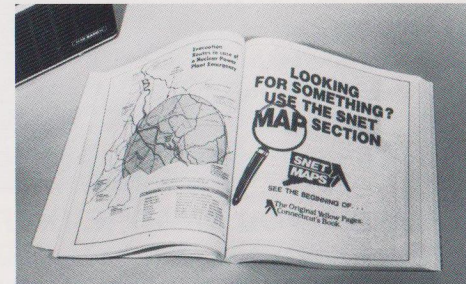
## INTRODUCTION

This booklet contains important information about the emergency plans for the Connecticut Yankee Nuclear Power Station in Haddam, CT and the Millstone Nuclear Power Station (Units 1, 2, and 3) in Waterford, CT.

It is very unlikely that a serious emergency will ever occur at either station. The plants are built with many safety features, discussed in detail on the following pages, designed to protect the public, even under the worst conditions. Nonetheless, your local community, the State of Connecticut, and Northeast Utilities (NU) have plans for protecting your health and safety in the event of an emergency at Connecticut Yankee or Millstone.

As with any emergency, your safety in a nuclear plant emergency would depend on your preparedness. You should read and understand this background information.

**If you live within Millstone's or Connecticut Yankee's Emergency Planning Zones (EPZ), a 10-mile radius around either plant, the first few yellow pages of your telephone book provide "what to do in an emergency" instructions for both natural and industrial emergencies.** If you are uncertain whether your home falls within the 10-mile radius, refer to the map in the yellow pages emergency instructions.



The first few pages of the yellow pages in your phone book contains important emergency instructions and information.



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## WHAT IS A NUCLEAR POWER PLANT EMERGENCY?

It is a situation which could result in the release of significant quantities of radioactive material. Normally, radioactive materials are contained within the plant by various protective barriers and treatment systems, which are described in more detail in this booklet.

In the very unlikely event of an accident during which these barriers and/or treatment systems fail to work properly, radioactive materials might escape from the plant. If this were to occur, people could receive radiation exposure.

## HOW WOULD YOU KNOW IF THERE IS AN EMERGENCY?

Sirens have been set up throughout the 10-mile EPZ to alert the public to all types of emergencies such as nuclear plant emergencies, natural disasters, or other emergency situations. These are activated by your town/city officials, if necessary.

A steady siren tone (about 3 minutes long) will alert residents to tune into the Emergency Broadcast System (EBS) on radio or television.



The siren system for the Connecticut Yankee and Millstone Nuclear Stations consists of 381 sirens in the 29 communities surrounding the two plant sites.

The EBS has been established in cooperation with the State of Connecticut Office of Emergency Management. The EBS allows local and state officials to interrupt radio and television programming with emergency information.

The following stations include statewide and local EBS radio and TV stations:

**Radio:**

Statewide:

WTIC -- 1080 AM, 96.5 FM

WDRC--1360 AM, 102.9 FM

CY and Millstone local stations:

WCNX--1150 AM

WIHS--104.9 FM

WLIS --1420 AM

WICH--1310 AM

WCTY--97.7 FM

WTYD--100.9 FM

WNLC--1510 AM

WSUB--980 AM

**TV:**

WFSB--Channel 3

WTNH--Channel 8

WVIT -- Channel 30

WTWS--Channel 26

**(Note: Refer to the first few yellow pages in your phone book for the actual EBS stations in your area. In the event of an actual emergency, most of Connecticut's radio and television stations would be linked into the EBS and would be broadcasting emergency information.)**



In the event of an emergency, you should tune into your Emergency Broadcast System (EBS) TV or radio station. State or local officials will provide specific instructions through the EBS. EBS stations are listed under the "Emergency Instructions" section in the yellow pages.

## **WHAT SHOULD YOU DO IN A NUCLEAR PLANT EMERGENCY?**

**(Note: Specific and current instructions are contained in the first few yellow pages of the telephone book for communities within the 10-mile EPZ)**



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If you hear a steady 3-minute siren tone, turn on your radio or television. Tune in to the EBS stations in your area for information. **STAY CALM**—Remember, a nuclear power plant emergency could take hours to develop into a situation that could affect public health and safety. You will be kept informed by local and state officials as long as necessary.

Remember, the sirens are intended only to alert you to tune in to the EBS stations for more information or instructions. The situation may or may not be related to the nuclear plants. An evacuation is not likely to be required. You may be advised that your area is not affected or that you should stay indoors. Follow the instructions you are given at that time. Please do not call local authorities.

The sirens are controlled by local community officials and are maintained and routinely tested by NU. Each year, a full-scale test of all sirens in the 10-mile EPZ is performed at each plant site, usually during an emergency drill. Through advertisements in local newspapers, the public is told in advance when these siren tests will take place. In addition, many local communities routinely test their sirens and some use them as part of their fire warning systems.

The sirens emit several different tones that serve different emergency functions:

1. A steady 3-minute tone. As previously described, this indicates a natural or commercial disaster such as severe weather, chemical accidents, floods, or nuclear plant accident. This 3-minute tone may be repeated.
2. A quickly wavering tone. This signals a warning of attack from an enemy/foreign power.
3. A short tone, repeated a number of times, is usually a fire signal. (Note: Not all communities use the sirens as fire signals)
4. A public address (voice) mode for announcements from the community's emergency operations center.

If you hear the steady 3-minute tone, keep tuned to the EBS for further instructions. Do not evacuate unless an order is given!

If possible, notify your neighbors of the alert without using the telephone. Try not to use the phone unless it is a personal emergency.

**IF YOU ARE TOLD TO STAY HOME AND TAKE SHELTER**, stay indoors and close all windows, doors and fireplace dampers. Turn off all devices that draw in outside air, such as air conditioners and fans. If possible, move to a room without windows, or to the basement. Food already in your home is safe to eat, though food from outside sources may need to be checked. If you must go outside, cover your mouth and nose with a moist cloth.

## IF AN EVACUATION IS ADVISED

**In the event of an emergency, evacuation would be advised only if absolutely necessary. Use the evacuation routes described for your town in the first few yellow pages of the telephone book unless otherwise directed by the EBS. DO NOT USE ANY OTHER ROUTES** as they may have been assigned to neighboring towns. State Police and local officials will be available to assist if an evacuation is necessary.

If possible, carpool with neighbors. If you have room, please check to see if any of your neighbors need a ride. Tune into an EBS station on your car radio.

## Emergency Planning Zone Relocation Areas

### Town Within EPZ

### Relocation Area

### **Connecticut Yankee EPZ**

Chester	New Haven
Colchester	Norwich
Deep River	New Haven
Durham	New Haven
East Haddam	Norwich
East Hampton	UConn-Storrs
Essex	New Haven
Haddam	Wethersfield
Hebron	UConn-Storrs
Killingworth	New Haven
Lyme	New Haven
Madison	New Haven
Marlborough	UConn-Storrs
Middlefield	New Haven
Middletown	Hartford
Portland	Wethersfield
Salem	Norwich
Westbrook	New Haven

### **Millstone EPZ**

East Lyme	New Haven
Fishers Island, N.Y.	Windham
Groton (Town and City)	Norwich
Ledyard	UConn-Storrs
Lyme	New Haven
Montville	East Hartford
New London	Windham
Old Lyme	New Haven
Old Saybrook	New Haven
Waterford	Wethersfield



Each community within the EPZs of Connecticut Yankee and Millstone has been assigned a relocation area within a host community. This area is located at least 15 miles from the plant. It is important to know what relocation area you should go to.

The relocation area provides a place to account for and temporarily shelter evacuees affected by an emergency. It also provides a place where families can gather if they have been separated. Red Cross registration, shelter, food, clothing, medical attention, etc. will be available.

#### **What to Bring With You—**

1. Plan for three days away, even though it may be only a few hours.
2. Pack the following items:
  - Blankets and pillows.
  - Two changes of clothing per person.
  - Medication you are required to take.
  - Baby supplies.
  - Toiletries.
  - Portable radio, flashlight, batteries.
  - Cash and checkbook.

#### **What To Do Before You Leave Home—**

- Close all windows and drapes.
- Turn off all devices that draw outside air.
- Turn off all lights and electrical appliances except the refrigerator and freezer.
- Leave food and water for pets. (Pets cannot be brought to the relocation center.)
- Lock all windows and doors.
- Proceed to your relocation area. (Transportation will be provided for those who do not have a personal vehicle and have registered with the local Civil Preparedness Office, as described below under "What If You Have Special Needs?")

#### **WHAT IF YOUR CHILDREN ARE IN SCHOOL?**

If an emergency situation developed in your area and action by the public was required, school officials will be contacted.



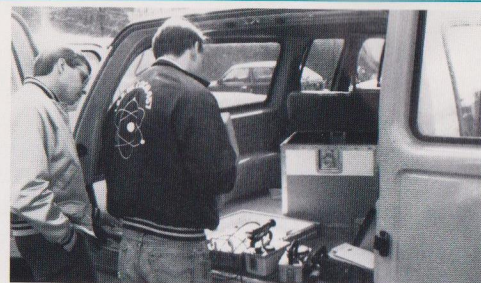
If a school is in the affected area, the school children will be sheltered or evacuated to the host community's relocation area (**refer to the first few yellow pages of your phone book for relocation areas**). If evacuation is ordered, parents should meet their children at the relocation area. **PAR-ENTS SHOULD NOT ATTEMPT TO PICK UP CHILDREN AT SCHOOL.**

### WHAT IF YOU HAVE SPECIAL NEEDS?

If you or someone you know has special needs, you should register with your local Civil Preparedness Office, local Visiting Nurses Services, or send in the special needs card at the front of this booklet. This would apply to someone who is disabled, has a hearing or vision impairment, or has special transportation needs. Don't wait for an emergency to register for help.

### HOW WOULD YOU KNOW THE EMERGENCY HAS ENDED?

Radiation levels would be monitored by federal and state officials, as well as by NU. When these levels are determined to be safe, you would be told promptly over the EBS by public officials directly or through the news media.



Radiation monitoring tests are conducted during an emergency preparedness drill.

### WHERE DOES RADIATION COME FROM?

On average, residents of Connecticut receive about 344 millirem (mrem)\* of radiation exposure per year. Approximately 284 mrem of that exposure are from natural sources such as cosmic radiation, and radiation from the earth's surface. The balance is from commercial sources, primarily medical uses, air travel, and consumer products. NU's nuclear power plants contribute an average of less than 0.1 mrem per year to persons living within 50 miles of the plant; 1 to 3 mrem to a person located at the site boundary of the plant for a year. To put these numbers in perspective, the average chest X-ray results in an exposure of 6 mrem; a cross-country plane trip results in an average exposure of 2-3 mrem. Thus, it can be seen that the average person will receive far

\* A millirem is 1/1000 of one rem, a standard measure of radiation dosage.



## SOURCES OF RADIATION

(1 rem = 1,000 millirem)

Annual Radiation Dose (millirem/year)

I. Natural Radiation Sources	
A. Cosmic (from outer space)	
Connecticut and Massachusetts.....	27
B. Terrestrial (from the earth's surface)	
Connecticut.....	16
Massachusetts.....	28
C. Food Consumed and the Human Body	
Itself.....	40
D. Inhaled Indoor (Radon).....	200
SUBTOTAL OF A, B, C, D	
Connecticut.....	284
Massachusetts.....	300
II. Technologically Enhanced Exposures to Natural Sources	
A. Radioactivity in Building Materials.....	7
(varies from wood frame to brick to stone)	
B. Air Travel (round trip cross-country).....	5
C. Natural Gas (Radon-222)	
Cooking (lung).....	5
Heating (lung).....	22
D. Smoking (30 cigarettes/day)	
Certain areas of the lung.....	Up to 16,000
III. Man-made Sources	
A. Medical Diagnosis (per person).....	53
B. Consumer Products (TV).....	1
C. Nuclear Power Station	
(within 50 miles).....	0.1
(at site boundary).....	1 to 3

The average resident of Connecticut and Massachusetts receives a total of about 344-360 millirem/year from natural and other common sources of radiation.

**References:** National Council on Radiation Protection and Measurements Report No. 92 (12/87), Report No. 93 (9/87), Report No. 94 (12/87), Report No. 95 (12/87).

more radiation exposure from one year's normal everyday activities and from natural sources than he or she will from lifetime exposures to normal nuclear power plant operations.

If, however, a serious nuclear plant accident were to occur, radioactivity levels far higher than normal could be released to the environment. In all but the most severe accidents, plant releases would remain well below a few hundred millirem. For example, individuals living within 10 miles of the Three Mile Island nuclear plant received an average dose of 8 mrem from the plant's 1979 accident, the most severe in the history of U.S. nuclear power operations. The vast majority of the radioactivity from the damaged nuclear core was contained by one of the protective barriers, the reactor containment building.

Federal and state requirements call for a consideration of evacuations if it is expected that offsite radiation levels will exceed 1,000 mrem, and mandatory evacuation if they are expected to exceed 5,000 mrem. In severe accidents, with failure of the plant's various safety systems described below, these levels of radiation could be exceeded within one to ten miles of the power station.



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## HOW QUICKLY WOULD A NUCLEAR PLANT ACCIDENT DEVELOP?

Contrary to some popular misconceptions, a nuclear plant emergency would not necessarily be a sudden event. A severe accident could take hours or days to develop, enabling state and local officials to take the necessary public protective actions in a timely fashion.

Substantial barriers have been built to prevent the release of radioactivity to the environment. Even if they failed, they would dramatically slow down and reduce the release of radioactivity from the plant. These barriers are discussed below in more detail.

A persistent, yet false contention is that a nuclear plant can explode like an atomic bomb. That simply is not true. The fuel in a nuclear plant is not concentrated enough to create such a rapid release of energy.

## HOW ARE NUCLEAR PLANT ACCIDENTS PREVENTED FROM OCCURRING?

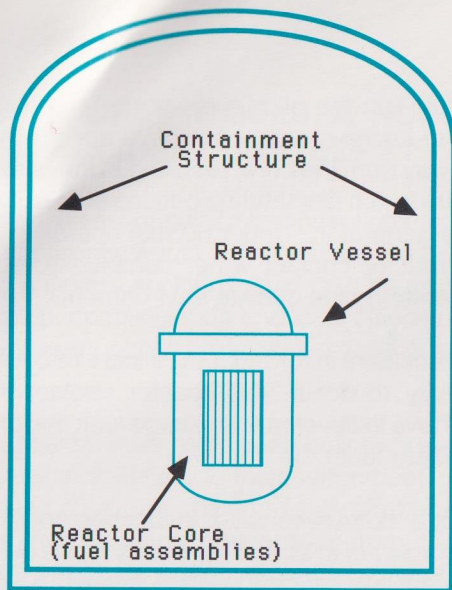
During operations at a nuclear plant, water continually circulates through the reactor's core—the nu-

clear fuel—in the plant's reactor. This water, referred to as the reactor coolant, is used to transfer heat away from the core, resulting in the production of steam which ultimately produces electricity in the turbine-generator. Under normal operating conditions, reactor coolant water continually recycles, never entering the outside environment.

For an accident involving a significant release of radioactivity to occur, this reactor coolant system would have to develop a very large leak and uncover the nuclear fuel.

NU has a comprehensive inspection and maintenance program at its nuclear plants that is designed to prevent the reactor coolant system from ever losing its water in the first place. Each of the plants was built to exact specifications, using only the highest quality materials, to ensure that plant systems maintain their integrity.

If a leak did develop in the reactor coolant system, numerous backup safety systems are on standby to supply additional water to keep the core covered. Each plant has several emergency cooling systems designed to keep the core covered under a variety of worst-case accidents, and each of these systems has its own backup. This ensures that the core will remain covered with water even if a piece of equipment failed to work properly.



Connecticut's nuclear power plants are designed with three primary barriers to prevent, or significantly postpone, the release of radioactivity to the environment in the event of an accident. The first barrier is the fuel pellet cladding, which retains virtually all radioactivity produced under normal operating conditions. The second is the reactor coolant system boundary, which is a steel vessel and assorted piping 3 to 9 inches thick. The third barrier is the containment structure, made of reinforced concrete 2.5 to 4.5 feet thick and lined with 1/4-inch steel.

## SUPPOSE THE BACKUP SAFETY SYSTEMS FAILED?

Because these systems are vital to the plant's safety, they are frequently tested, inspected and maintained. It is highly unlikely that they would fail if they were ever called upon. However, if they did fail, multiple barriers in the plant would prevent or, at the very least, significantly postpone the release of radioactivity to the environment.

The first barrier is the fuel rods which contain the nuclear fuel pellets. These fuel rods are metal cylinders, known as "cladding," and are made of a high-quality zirconium or stainless steel alloy with a high melting point (approximately 3400 degrees Fahrenheit). The cladding retains virtually all of the radioactivity produced in the nuclear fuel pellets under normal operating conditions.

The reactor coolant system itself also acts as a barrier. It includes the reactor itself, a high quality carbon-steel vessel 3 to 9 inches thick, along with any piping or other equipment through which the water travels.

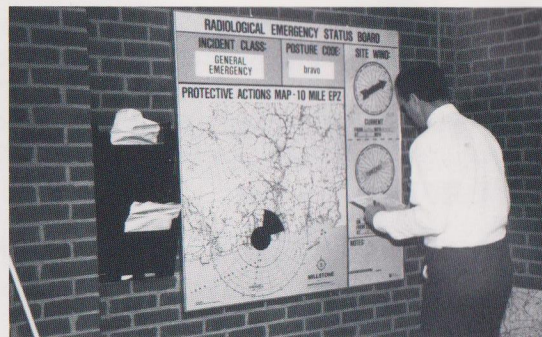


If both of these barriers fail, a containment structure surrounds the reactor coolant system. This building is made of a 1/4-inch steel liner surrounded by reinforced concrete, 2.5 to 4.5 feet thick. The containments around Connecticut Yankee and the three Millstone plants are designed to withstand not only the internal forces generated by a severe accident, but also external forces such as a tornado, hurricane or earthquake, and can even withstand the impact of a commercial jet airplane.

Thus, even if a severe accident occurred at a nuclear plant, the design of the plant would give public officials ample time to make public protective action decisions and notify the public.

## **WHO COULD BE AFFECTED IN A NUCLEAR EMERGENCY?**

It is very unlikely that everyone in a 10-mile radius would be affected in a nuclear emergency. The precautions to take would depend on where you live, the amount of radiation escaping from the plant, and the direction and speed of the wind.



Emergency management officials determine public protective actions and initiate the protective actions, as necessary.

For example, if a significant amount of radioactive material could be released into a slow wind, residents immediately downwind from the plant might be directed to evacuate if road and weather conditions permit.

Rapidly shifting winds, on the other hand, could quickly disperse radioactive material, affecting a larger area but in less concentrated amounts. Residents in this larger area might be directed to take shelter.

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State authorities would consider levels of radiation, wind patterns and overall weather conditions in directing residents to take shelter or evacuate. In the case of the more probable, lower consequence types of nuclear accidents, no actions by the public would be necessary.

## **WHAT SHOULD FARMERS DO ABOUT LIVESTOCK?**

(Note: A booklet entitled "Radiological Emergency Information for Connecticut Agriculture" has been distributed to all farmers, livestock owners and fruit and vegetable growers within a 50-mile radius of the Connecticut Yankee and Millstone stations.)

When warned that protective actions are needed, farmers should leave their livestock ample food and water, provide as much shelter as possible, use stored feed such as hay and grain that has been covered from the elements, cover feed that is outdoors, or bring feed inside a building. Tend to milk animals first to avoid possible contamination of their milk.

No one may enter the evacuated area without permission from local government authorities. However, if radiation levels permit, people with livestock probably would be allowed short visits to their farms for feeding or milking.

## **NUCLEAR EMERGENCY CLASSIFICATIONS**

The Nuclear Regulatory Commission (NRC) classifies nuclear plant accidents into four categories of increasing severity. The categories describe a nuclear plant emergency based on plant conditions. In addition, the State of Connecticut uses posture codes for initiating public protective actions.

Northeast Utilities is responsible for classifying an event and notifying federal, state and local authorities within 15 minutes. NU also recommends public protective actions to state officials.

The state and local governments decide and initiate public protective actions. They are responsible for notifying the public of these actions within 15 minutes of the decision.

### **UNUSUAL EVENT/Posture Code Delta-One**

This category does not mean an emergency has occurred; it does mean that something minor, yet out of the ordinary has happened. There is no danger to the public. No unplanned radioactive release is expected and no protective actions are required.



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### **UNUSUAL EVENT/Posture Code Delta-Two**

This category means the same as above except the event has involved a small unplanned radioactive release. No protective actions are required.

### **ALERT/Posture Code Charlie-One**

This category involves an actual or potential for a small radioactive release (5 to 50 mrem at the site boundary). The purpose of this category is to ensure that emergency personnel are ready to respond if the situation should become more serious.

State and local emergency operation centers may be activated at this level and the state EBS would be brought to standby status. Radioactive releases and food pathways would be monitored if necessary. No public protective actions are required.

### **SITE AREA EMERGENCY/Posture Code Charlie-Two**

This category means that there is an actual or potential for a failure of plant safety systems. A significant radioactive release (50 to 1,000 mrem at the site boundary) is possible.

State and local emergency operations centers will be activated. The sirens within the 10-mile EPZ would be sounded as a warning to tune in to a local radio or TV Emergency Broadcast Station for information. Radioactive releases and food pathways would be monitored. Milk animals would be put on stored feed downwind from the plant.

### **GENERAL EMERGENCY/Posture Code Bravo**

This category means that events have occurred which involve failure of plant safety systems and possible reactor core damage. A large radioactive release (1,000 to 5,000 mrem at the site boundary) is possible.

The public would be notified through the EBS and instructed by government officials on what actions to take. Protective actions would include sheltering and access control for a 2-mile radius and 5 miles downwind of the plant. Evacuation might be implemented immediately within a 2-mile radius. Milk and animal feed distribution would be controlled, as necessary.

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## **GENERAL EMERGENCY/Posture Code Alpha**

This means that events have occurred which may involve substantial reactor core damage, failure of safety systems and possible loss of containment integrity. A very large radioactive release (over 5,000 mrem at the site boundary) is possible.

An immediate "take shelter" order and access control for a 2-mile radius and 10 miles downwind would be implemented. Evacuation, if it is ordered by the state, would likely be implemented within a 2-mile radius and 5 miles downwind. Milk animals within 10 miles in the downwind direction would be placed on stored feed.

## **IN CONCLUSION**

Nuclear power is a safe and reliable form of electricity generation. Northeast Utilities is proud to be considered among the leading nuclear operating utilities in the country.

The state and local governments and NU are deeply committed to providing communities surrounding the nuclear facilities with the most accurate, timely, and detailed information possible concerning plant safety and emergency preparedness. The emergency plans are tested annually, and are observed and critiqued by federal officials.

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For additional information on NU's nuclear operations or emergency planning activities, call or visit:

*Millstone Information and Science Center*

278 Main Street

Niantic, Connecticut 06357

(203) 444-4234

**or**

*Connecticut Yankee Energy Information Center*

Haddam Neck

Rural Route #1, Box 127

East Hampton, Connecticut 06424

(203) 267-9279

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a handy place in your home.**



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WESTERN MASSACHUSETTS ELECTRIC COMPANY  
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